

(FILE 'HOME' ENTERED AT 14:18:39 ON 04 SEP 2003)

FILE 'CAPLUS' ENTERED AT 14:18:49 ON 04 SEP 2003

L1	0 S NITROXYL AND CELLULOSE AND OXIDATION
L2	0 S TEMPO AND CELLULOSE AND OXIDATION
L3	41 S TEMPO AND CELLULOSE AND OXIDATION

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=> d all 21-25

L3 ANSWER 21 OF 41 CAPLUS COPYRIGHT 2003 ACS on STN  
AN 2001:686290 CAPLUS  
DN 136:6212  
TI Progress of nitroxyl radical and its selective oxidation of polysaccharides  
AU Sun, Bin; Wu, Lishun; Ma, Jinghong; Liang, Borun  
CS State Key Lab. Fiber Modification, Donghua Univ., Shanghai, 200051, Peop. Rep. China  
SO Huaxue Shiji (2001), 23(4), 216-219  
CODEN: HUSHDR; ISSN: 0258-3283  
PB Huagongbu Huaxue Shiji Xinsizhan  
DT Journal; General Review  
LA Chinese  
CC 33-0 (Carbohydrates)  
AB A review. Polysaccharides, such as cellulose, pullan, chitin, chitosan, can be selectively oxidized using selective oxidant, nitroxyl radical. The oxidized compds. can act as intermediate for the prepn. of polysaccharides' derivs. So nitroxyl radical is useful for the prepn. of environmental protective polymer, degradable polymer and polymer for medical use. In this paper, nitroxyl radical has been introduced briefly and the development of selective oxidn. of polysaccharides using TEMPO as selective oxidant has been reviewed.  
ST review polysaccharide oxidn nitroxyl radical  
IT Oxidation  
(progress of nitroxyl radical and its selective oxidn. of polysaccharides)  
IT Nitroxides  
Polysaccharides, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(progress of nitroxyl radical and its selective oxidn. of polysaccharides)  
  
L3 ANSWER 22 OF 41 CAPLUS COPYRIGHT 2003 ACS on STN  
AN 2001:497072 CAPLUS  
DN 136:152913  
TI Chemical modifications of cellulose by TEMPO-mediated oxidation  
AU Isogai, Akira; Shibata, Izumi  
CS Tokyo Univ., Japan  
SO Sen'i Gakkaishi (2001), 57(6), P163-P167  
CODEN: SENGAS; ISSN: 0037-9875  
PB Sen'i Gakkai  
DT Journal; General Review  
LA Japanese  
CC 43-0 (Cellulose, Lignin, Paper, and Other Wood Products)  
AB A review.  
ST review cellulose degrdn TEMPO mediated oxidn  
IT Polymer degradation  
(oxidative; chem. modifications of cellulose by TEMPO-mediated oxidn.)  
IT 2564-83-2, TEMPO  
RL: CAT (Catalyst use); USES (Uses)  
(chem. modifications of cellulose by TEMPO-mediated oxidn.)  
IT 9004-34-6, Cellulose, processes  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
(chem. modifications of cellulose by TEMPO-mediated oxidn.)

L3 ANSWER 23 OF 41 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:392630 CAPLUS  
 DN 135:228352  
 TI Influence of carboxyl group on the acid hydrolysis of cellulose  
 AU Hirosawa, Shuichi; Minato, Kazuya; Nakatsubo, Fumiaki  
 CS Graduate School of Agriculture, Kyoto University, Kyoto, 606-8502, Japan  
 SO Journal of Wood Science (2001), 47(2), 141-144  
 CODEN: JWSCFG; ISSN: 1435-0211  
 PB Springer-Verlag Tokyo  
 DT Journal  
 LA English  
 CC 43-3 (Cellulose, Lignin, Paper, and Other Wood Products)  
 AB Cellulose (I) isolated from wood is more susceptible than cotton I to homogeneous hydrolysis in H3PO4. The influence of carboxyl group introduction at the C6 position on the hydrolysis rate of I in 82.5% H3PO4 was studied as a model of the oxidn. of I during pulping. The rate const. of hydrolysis for dissolving pulp was larger than that of cotton I at temps. of 25-35.degree.. Mercerized cotton I was partially oxidized regio-selectively at the C6 position by a free radical system using 2,2,6,6-tetramethylpiperidine 1-oxyl (TEMPO). The oxidized I was obtained at a range of 1.7-12.7 mEq carboxyl content per 100 g I. The hydrolysis rate of the oxidized I samples accelerated with increasing carboxyl content in the samples.  
 ST carboxyl group effect phosphoric acid hydrolysis TEMPO oxidized cellulose  
 IT Hydrolysis  
 (acid; carboxyl group effect on phosphoric acid hydrolysis of TEMPO-oxidized cellulose)  
 IT Carboxyl group  
 Oxidation  
 (carboxyl group effect on phosphoric acid hydrolysis of TEMPO-oxidized cellulose)  
 IT 2564-83-2, TEMPO 7664-38-2, Phosphoric acid, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (carboxyl group effect on phosphoric acid hydrolysis of TEMPO-oxidized cellulose)  
 IT 9004-34-6, Cellulose, processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (carboxyl group effect on phosphoric acid hydrolysis of TEMPO-oxidized cellulose)  
 RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE  
 (1) Isogai, A; Cell Commun 1998, V5, P136  
 (2) Isogai, A; Cellulose Society of Japan preprints of cellulose R&D 4th annual meeting of the Cellulose Society of Japan 1997, P41  
 (3) Lindberg, B; Actes Symp Intern Grenoble 1964, P303 CAPLUS  
 (4) Marchessault, R; Svensk Papperstidn 1959, V62, P230 CAPLUS  
 (5) Matsuzaki, K; Mokuzaikagaku 1968, V1, P159  
 (6) Nakano, J; Svensk Papperstidn 1962, V65, P29 CAPLUS  
 (7) Onabe, F; The Japan Wood Research Society revised and enlarged edition of Mokuzaikagaku Jikkensho 1989, P173  
 (8) Ranby, B; J Polym Sci 1959, V36, P561 CAPLUS  
 (9) Usuda, M; Kogyo Kagaku Zasshi 1967, V70, P349 CAPLUS

L3 ANSWER 24 OF 41 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:324452 CAPLUS  
 DN 134:312700  
 TI Polysaccharide-aldehydes, their oxidation preparation, and paper containing them  
 IN Cimecioglu, Levent A.; Thomaidis, John S.  
 PA National Starch and Chemical Investment Holding Corp., USA  
 SO Jpn. Kokai Tokkyo Koho, 42 pp.  
 CODEN: JKXXAF  
 DT Patent

LA Japanese  
 IC ICM C08B031-18  
 ICS D21H017-47; D21H021-20  
 CC 43-7 (Cellulose, Lignin, Paper, and Other Wood Products)  
 Section cross-reference(s): 44

FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001122904	A2	20010508	JP 2000-247623	20000817
	US 6586588	B1	20030701	US 2000-636069	20000810
PRAI	US 1999-375931	A	19990817		
	US 2000-636069	A	20000810		

OS MARPAT 134:312700

AB The polysaccharide aldehydes with a minimal carboxylic acid group content and .ltoreq.15 mol% [based on 1 mol anhyd. sugar unit (ASU)] C6-aldehyde group, useful for paper strengthening agents, are manufd. by oxidizing polysaccharides in the presence of oxidants having an equiv. oxidizing power of .ltoreq.14.18 g (based on 1 mol ASU) active Cl and a sufficient amt. of nitroxyl radical mediators in H2O at .ltoreq.15.degree. and pH 8.0-10.5. Thus, 0.28 mol (based on ASU) cationic maize starch was oxidized in the presence of 5 mol% NaClO and **TEMPO** at <15.degree. and pH 9.5 to show contents of aldehyde group and carboxylic acid group, 2.3 mol% and 1.1 mol%, resp.

ST polysaccharide aldehyde starch oxidn sodium hypochloride; paper strengthening polysaccharide aldehyde **TEMPO**

IT Polysaccharides, uses

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (oxidized; oxidn. prepn. of polysaccharide aldehydes for paper strengthening agents)

IT Oxidation

Paper

(oxidn. prepn. of polysaccharide aldehydes for paper strengthening agents)

IT 2564-83-2, **TEMPO** 14691-89-5, 4-Acetamido-**TEMPO**

RL: MOA (Modifier or additive use); USES (Uses)

(mediator; oxidn. prepn. of polysaccharide aldehydes for paper strengthening agents)

IT 7647-15-6, Sodium bromide, uses

RL: MOA (Modifier or additive use); USES (Uses)

(oxidant precursor; oxidn. prepn. of polysaccharide aldehydes for paper strengthening agents)

IT 7681-52-9 13824-96-9

RL: MOA (Modifier or additive use); USES (Uses)

(oxidant; oxidn. prepn. of polysaccharide aldehydes for paper strengthening agents)

IT 9000-30-ODP, Guar gum, oxidized 9004-62-ODP, 2-Hydroxyethyl cellulose, oxidized 9037-22-3DP, Waxy maize starch, reaction products with chlorohydroxypropyltrimethylammonium chloride, oxidized 9057-02-7DP, Pullulan, oxidized

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(oxidn. prepn. of polysaccharide aldehydes for paper strengthening agents)

L3 ANSWER 25 OF 41 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:300943 CAPLUS

DN 134:312682

TI Method of making carboxylated cellulose fibers and products

IN Jewell, Richard A.; Komen, Joseph Lincoln; Su, Bing; Weerawarna, S. Ananda; Li, Yong

PA Weyerhaeuser Company, USA

SO PCT Int. Appl., 52 pp.

CODEN: PIXXD2

DT Patent  
 LA English  
 IC ICM D21C009-00  
 ICS D21H011-20; C08B015-04  
 CC 43-6 (Cellulose, Lignin, Paper, and Other Wood Products)  
 FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001029309	A1	20010426	WO 2000-US27837	20001006
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6379494	B1	20020430	US 1999-418909	19991015
	EP 1238142	A1	20020911	EP 2000-970682	20001006
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
	JP 2003512540	T2	20030402	JP 2001-532283	20001006
PRAI	US 1999-418909	A	19991015		
	US 1999-272137	A2	19990319		
	WO 2000-US27837	W	20001006		

OS MARPAT 134:312682

AB A method of making highly carboxylated cellulose fibers whose fiber strength and d.p. is not significantly sacrificed comprises (1) oxidizing the cellulose fiber (kraft pulp) with a cyclic nitroxide free radical compd. as a primary oxidant and a hypohalite salt as a secondary oxidant under aq. alk. conditions; and (2) treating the oxidized cellulose against d.p. loss in aq. suspension with a stabilizing agent selected from the group consisting of reducing agent and tertiary oxidizing agent. The product is esp. useful as a papermaking fiber where it contributes strength and has a higher attraction for cationic additives, and it is also useful as an additive to recycled fiber to increase strength.

ST carboxylated cellulose fiber oxidn stabilization; paper pulp  
carboxylated cellulose fiber

IT Oxidation catalysts

Oxidizing agents

Reducing agents

(cellulose fiber treated with; method of making carboxylated cellulose fibers and products for papermaking)

IT Cellulose pulp

(kraft; method of making carboxylated cellulose fibers and products for papermaking)

IT Carboxyl group

Paper

Stabilizing agents

(method of making carboxylated cellulose fibers and products for papermaking)

IT Cellulose pulp

(sulfite; method of making carboxylated cellulose fibers and products for papermaking)

IT Paper

(tissue; method of making carboxylated cellulose fibers and products for papermaking)

IT 2226-96-2, 4-Hydroxy-TEMPO 2564-83-2, TEMPO  
 2564-87-6 2896-70-0, 4-Oxo-TEMPO 3229-53-6 3264-93-5  
 14691-88-4, 4-Amino-TEMPO 14691-89-5 31645-22-4  
 95407-69-5, 4-Methoxy-TEMPO 98254-32-1 154186-17-1  
 184160-78-9

RL: CAT (Catalyst use); NUU (Other use, unclassified); USES (Uses)  
 (cellulose fiber treated with; method of making carboxylated  
 cellulose fibers and products for papermaking)

IT 7647-15-6, Sodium bromide, uses 7681-52-9, Sodium hypochlorite  
 7722-84-1, Hydrogen peroxide, uses 7758-19-2, Sodium chlorite  
 10049-04-4, Chlorine dioxide 16940-66-2, Sodium borohydride  
 335133-08-9, Stabrex ST 70

RL: NUU (Other use, unclassified); USES (Uses)  
 (cellulose fiber treated with; method of making carboxylated  
 cellulose fibers and products for papermaking)

IT 150980-92-0P

RL: CAT (Catalyst use); IMF (Industrial manufacture); NUU (Other use,  
 unclassified); PREP (Preparation); USES (Uses)  
 (cellulose fiber treated with; prepn. of nitroxide free  
 radical for making carboxylated cellulose fibers and products  
 for papermaking)

IT 36793-27-8P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (prepn. of nitroxide free radical for making carboxylated  
 cellulose fibers and products for papermaking)

IT 104-15-4, p-Toluenesulfonic acid, reactions 107-21-1, Ethylene glycol,  
 reactions 826-36-8, 2,2,6,6-Tetramethyl-4-piperidone

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (prepn. of nitroxide free radical for making carboxylated  
 cellulose fibers and products for papermaking)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Briskin, T; US 3575177 A 1971  
 (2) Kitaoka, T; NORDIC PULP AND RESEARCH JOURNAL 1999, V14(4), P279 CAPLUS  
 (3) Valtion Teknillinen; WO 9923117 A 1999 CAPLUS

L3 ANSWER 36 OF 41 CAPLUS COPYRIGHT 2003 ACS on STN

AB Various cellulosic materials were oxidized with sodium hypochlorite and sodium bromide in the presence of a catalytic amt. of 2,2,6,6-tetramethylpiperidine-1-oxyl radical (TEMPO) at pH 10-11 and room temp. When native celluloses were oxidized by this method, their carboxyl contents increased up to 0.5 mEq/g. Although water-sol. oxidized products could not be obtained from native celluloses, this oxidn. must be suitable for efficient surface modifications of chem. pulps or for prepn. of highly water-swollen cellulosic materials. On the other hand, when the TEMPO-mediated oxidn. was applied to mercerized and regenerated celluloses, water-sol. products were obtained quant. NMR analyses revealed that the products were almost pure beta-1,4-linked polyglucuronic acid; the oxidn. occurred almost selectively at C6 of cellulose to form cellouronic acid.

L3 ANSWER 37 OF 41 CAPLUS COPYRIGHT 2003 ACS on STN

AB A review with 25 refs. Recent reports concerning TEMPO-mediated oxidn. of alc. compds. were introduced briefly, and application of TEMPO-NaBr-NaClO oxidn. systems under aq. conditions to cellulosic materials was reviewed on the basis of the results obtained in our lab. When mercerized and regenerated celluloses were used as starting materials, water-sol. oxidized products were quant. obtained by the TEMPO-NaBr-NaClO oxidn. at pH 10-11. <sup>13</sup>C-NMR anal. showed that the oxidized products had almost pure structures of .beta.-1,4-linked glucuronic acid sodium salt, i.e. cellouronic acid Na salt. On the other hand when native celluloses were oxidized, the products did not become water-sol., owing to low degree of oxidn. Possibilities to utilize cellouronic acid and partly oxidized pulp fibers by the TEMPO-NaBr-NaClO system are discussed on the basis of their characteristics.

=> d all 11,14,18

L3 ANSWER 11 OF 41 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:944512 CAPLUS

DN 138:14801

TI Hypochlorite-free method for preparation of stable carboxylated  
carbohydrate products

IN Komen, Joseph L.; Weerawarna, Ananda S.; Jewell, Richard A.

PA Weyerhaeuser Company, USA

SO Eur. Pat. Appl., 20 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM C08B015-04

ICS C08B031-18

CC 43-3 (Cellulose, Lignin, Paper, and Other Wood Products)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1264845	A2	20021211	EP 2002-253744	20020529
	EP 1264845	A3	20030521		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	US 2003083491	A1	20030501	US 2001-875177	20010606
	JP 2003089701	A2	20030328	JP 2002-163750	20020605
PRAI	US 2001-875177	A	20010606		

AB A method of making a carboxylated carbohydrate is disclosed, with cellulose being a preferred carbohydrate material. Carboxylated cellulose fibers, whose fiber strength and d.p. is not significantly sacrificed, can be produced. The method involves the use of a catalytic amt. of a hindered cyclic oxammonium compd. as a primary oxidant and ClO<sub>2</sub> as a secondary oxidant in an aq. environment. The oxammonium compds. may be formed in situ from their corresponding amine, hydroxylamine, or nitroxyl compds. The oxidized cellulose may be stabilized against d.p. loss and color reversion by further treatment with an oxidant, e.g. NaClO<sub>2</sub> or a ClO<sub>2</sub>/H<sub>2</sub>O<sub>2</sub> mixt. Alternatively, it may be treated with a reducing agent, e.g. NaBH<sub>4</sub>. In the case of cellulose, the method results in a high percentage of carboxyl groups located at the fiber surface. The product is esp. useful as a papermaking fiber where it contributes strength and has a higher attraction for cationic additives. The product is also useful as an additive to recycled fiber to increase strength. The method can be used to improve properties of either virgin or recycled cellulose pulp fibers. It does not require high alpha.-cellulose fiber, but is suitable for regular market pulps.

ST hypochlorite free prepn stable carboxylated cellulose fiber  
pulp for papermaking

IT Cellulose pulp

(carboxylated; hypochlorite-free catalytic oxidn. for prepn. of stable carboxylated cellulose fibers for pulping and papermaking)

IT Oxidation

Paper

(hypochlorite-free catalytic oxidn. for prepn. of stable carboxylated cellulose fibers for pulping and papermaking)

IT 9004-34-6D, Cellulose, carboxylated 9005-25-8D, Starch, carboxylated

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(fibers; hypochlorite-free catalytic oxidn. for prepn. of stable carboxylated cellulose fibers for pulping and papermaking)

IT 768-66-1D, 2,2,6,6-Tetramethylpiperidine, reaction products with chlorine dioxide 2564-83-2, Tempo 7722-84-1, Hydrogen peroxide, uses 7758-19-2 10049-04-4D, Chlorine dioxide, reaction products with



triacetone amine ketals 36793-28-9D, reaction products with chlorine dioxide 53825-32-4D, 7,7,9,9-Tetramethyl-1,4-dioxo-8-azaspiro[4.5]decane-2-methanol, reaction products with chlorine dioxide  
RL: NUU (Other use, unclassified); USES (Uses)

(oxidizing agent; hypochlorite-free catalytic oxidn. for prepn. of stable carboxylated **cellulose** fibers for pulping and papermaking)

IT 16940-66-2, Sodium borohydride (NaBH<sub>4</sub>)

RL: NUU (Other use, unclassified); USES (Uses)

(reducing agent; hypochlorite-free catalytic oxidn. for prepn. of stable carboxylated **cellulose** fibers for pulping and papermaking)

L3 ANSWER 14 OF 41 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:857993 CAPLUS

DN 138:256722

TI Studies on functionalization of paper and **cellulose**

AU Isogai, Akira

CS Graduate School of Agricultural and Life Sciences, University of Tokyo, Bunkyo-ku, Tokyo, Japan

SO Sen'i Gakkaishi (2002), 58(10), P262-P266

CODEN: SENGAS; ISSN: 0037-9875

PB Sen'i Gakkai

DT Journal; General Review

LA Japanese

CC 43-0 (Cellulose, Lignin, Paper, and Other Wood Products)

AB A review is given on nonaq. **cellulose** solvents and their application, behavior anal. of amorphous region in **cellulose**-based materials, mechanism of interaction between reactive size with **cellulose**, and modification of **cellulose** by catalytic oxidn. of **TEMPO**.

ST review paper **cellulose** functionalization

IT **Oxidation**

(catalytic; modification of **cellulose** by catalytic oxidn. of **TEMPO**)

IT Paper

(functionalization of paper and **cellulose**)

IT Sizes (agents)

(mechanism of interaction between reactive size with **cellulose**)

IT 9004-34-6, **Cellulose**, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)

(functionalization of paper and **cellulose**)

IT 2564-83-2, **TEMPO**

RL: RCT (Reactant); RACT (Reactant or reagent)

(modification of **cellulose** by catalytic oxidn. of **TEMPO**)

L3 ANSWER 18 OF 41 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:314951 CAPLUS

DN 136:325784

TI Method for the **oxidation** of aldehydes, hemiacetals and primary alcohols

IN Merbouh, Naby; Bobitt, James M.; Bruckner, Christian

PA University of Connecticut, USA

SO PCT Int. Appl., 30 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C07H007-033

CC 33-9 (Carbohydrates)

FAN.CNT 1

PATENT NO.

KIND DATE

APPLICATION NO. DATE

PI WO 2002032913 A1 20020425 WO 2001-US32491 20011017  
 W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,  
 CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM,  
 HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,  
 LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO,  
 RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN,  
 YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,  
 DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,  
 BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG  
 US 6498269 B1 20021224 US 2000-690614 20001017  
 AU 2002013363 A5 20020429 AU 2002-13363 20011017  
 PRAI, US 2000-690614 A 20001017  
 WO 2001-US32491 W 20011017  
 OS CASREACT 136:325784; MARPAT 136:325784  
 AB A method for the oxidn. of substrates comprising treating an aq., basic  
 soln. of a substrate having an oxidizable functionality using an elemental  
 halogen as terminal oxidant in the presence of an oxo-ammonium  
 catalyst/halide co-catalyst system. Use of elemental halogen, preferably  
 chlorine gas or elemental bromine, unexpectedly allows oxidn. without  
 significant degradn. of the substrate. The substrate is preferably a  
 monosaccharide, oligosaccharide, or polysaccharide, and the oxidizable  
 functionality is preferably an aldehyde, hemiacetal, or a primary alc. An  
 effective source of the oxo-ammonium catalyst is 2,2,6,6-  
 tetramethylpiperidiny-1-oxy (TEMPO) and a particularly  
 economical and effective catalyst is 4-acetylamino-2,2,6,6-  
 tetramethylpiperidiny-1-oxy. Thus, oxidn. of glucose with KBr and  
 gaseous chlorine in aq. KOH soln. in presence of 4-acetylamino-2,2,6,6-  
 tetramethylpiperidiny-1-oxy as catalyst gave monopotassium glutamate in  
 90% yield.  
 ST acetylaminotetramethylpiperidinyloxy catalyst oxidn aldehyde sugar prepn  
 uronate; oxoammonium catalyst oxidn aldehyde sugar prepn uronate; catalyst  
 oxidn aldehyde sugar monosaccharide oligosaccharide polysaccharide prepn  
 uronate  
 IT Oxidation catalysts  
 (oxidn. of aldehydes hemiacetals and primary alcs. in presence of  
 4-acetylamino-2,2,6,6-tetramethylpiperidiny-1-oxy as catalyst)  
 IT Uronic acids  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (oxidn. of aldehydes hemiacetals and primary alcs. in presence of  
 4-acetylamino-2,2,6,6-tetramethylpiperidiny-1-oxy as catalyst)  
 IT Monosaccharides  
 Oligosaccharides, preparation  
 Polysaccharides, preparation  
 RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic  
 preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (oxidn. of aldehydes hemiacetals and primary alcs. in presence of  
 4-acetylamino-2,2,6,6-tetramethylpiperidiny-1-oxy as catalyst)  
 IT 14691-89-5, 4-Acetylamino-2,2,6,6-tetramethylpiperidiny-1-oxy.  
 219543-09-6  
 RL: CAT (Catalyst use); USES (Uses)  
 (oxidn. of aldehydes hemiacetals and primary alcs. in presence of  
 4-acetylamino-2,2,6,6-tetramethylpiperidiny-1-oxy as catalyst)  
 IT 526-99-8P, Mucic acid 576-42-1P 9005-25-8DP, Starch, oxidized, sodium  
 salts 54173-03-4P, Disodium glucarate 197388-71-9P  
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (oxidn. of aldehydes hemiacetals and primary alcs. in presence of  
 4-acetylamino-2,2,6,6-tetramethylpiperidiny-1-oxy as catalyst)  
 IT 50-69-1, D-Ribose 50-99-7, D-Glucose, reactions 57-48-7, D-Fructose,  
 reactions 57-50-1, Sucrose, reactions 58-86-6, D-Xylose, reactions  
 59-23-4, D-Galactose, reactions 63-42-3, Lactose 69-79-4, Maltose  
 87-79-6, L-Sorbose 87-81-0, D-Tagatose 488-84-6, D-Ribulose

512-69-6, Raffinose    527-50-4, L-Xylulose    528-50-7, Cellobiose  
 551-68-8, D-Psicose    551-84-8, D-Xylulose    554-91-6, Gentiobiose  
 597-12-6, Melezitose    609-06-3, L-Xylose    921-60-8, L-Glucose  
 1114-34-7, D-Lyxose    1398-61-4, Chitin    1949-78-6, L-Lyxose    1949-88-8,  
 L-Altrose    1990-29-0, D-Altrose    2042-27-5, L-erythro-2-Pentulose  
 2595-97-3, D-Allose    2595-98-4, D-Talose    3458-28-4, D-Mannose  
 3615-56-3, D-Sorbose    4205-23-6, D-Gulose    5328-37-0, L-Arabinose  
 5934-56-5, L-Idose    5978-95-0, D-Idose    6027-89-0, L-Gulose    7635-11-2,  
 L-Allose    7776-48-9, L-Fructose    9000-01-5, Gum arabic    9000-69-5,  
 Pectins    9002-18-0, Agar    9004-34-6, Cellulose, reactions  
 9004-54-0, Dextran, reactions    9004-61-9, Hyaluronic acid    9005-25-8,  
 Starch, reactions    9005-32-7, Alginic acid    9005-82-7, Amylose  
 9014-63-5, Xylan    9034-32-6, Hemicellulose    9036-88-8, Mannan  
 9037-22-3, Amylopectin    9037-90-5, Fructan    9060-75-7, Arabinan  
 10016-20-3, .alpha.-Cyclodextrin    10030-80-5, L-Mannose    10323-20-3,  
 D-Arabinose    15572-79-9, L-Galactose    16354-64-6, L-Psicose  
 17598-82-2, L-Tagatose    23567-25-1, L-Talose    24259-59-4, L-Ribose  
 RL: RCT (Reactant); RACT (Reactant or reagent)

(oxidn. of aldehydes hemiacetals and primary alcs. in presence of  
 4-acetyl-amino-2,2,6,6-tetramethylpiperidiny-1-oxyl as catalyst)

RE.CNT 5        THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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